

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-2. (Canceled)

3. (Currently Amended) A display device comprising:

a plurality of pixels disposed in matrix over a substrate;

~~an active matrix circuit comprising a plurality of ~~pixels~~ pixel TFTs over ~~[[a]]~~ said substrate, each of said pixels comprising at least first and second thin film transistors and a pixel electrode wherein a gate electrode of the first thin film transistor is electrically connected to a gate line and a gate electrode of the second thin film transistor is electrically connected to a drain region of the first thin film transistor, and the pixel electrode is electrically connected to one of source and drain regions of the second thin film transistor;~~

~~a source driver and a gate driver which drive said active matrix circuit over said substrate; and~~

~~a circuit which converts m bit digital video data inputted from an external into n bit digital video data and provides said n bit digital video data to said source driver, where said m and said n are integers equal to or larger than 2 and satisfy $m > n$, wherein said circuit is formed over said substrate[[.]].~~

~~wherein each step of a voltage level for said voltage gray scale method is designated as $(V_H - V_L)/2^n$, where V_H is the highest voltage level of voltages inputted to a D/A converter circuit, and V_L is the lowest voltage level of voltages inputted to said D/A converter circuit.~~

4. (Currently Amended) A display device comprising:

a plurality of pixels disposed in matrix over a substrate;

an active matrix circuit comprising a plurality of pixel TFTs over said substrate;

a source driver and a gate driver which drive said active matrix circuit over said substrate; and

a circuit which converts m bit digital video data inputted from an external into n bit digital video data and provides said n bit digital video data to said source driver, where said m and said n are integers equal to or larger than 2 and satisfy $m > n$, wherein said circuit is formed over said substrate,

~~wherein each step of a voltage level for said voltage gray scale method is designated as $(VH - VL)/2^n$, where VH is the highest voltage level of voltages inputted to a D/A converter circuit, and VL is the lowest voltage level of voltages inputted to said D/A converter circuit, and~~

wherein one frame period comprises 2^{m-n} subframe periods.

5. (Currently Amended) A display device comprising:

a plurality of pixels disposed in matrix over a substrate;

an active matrix circuit comprising a plurality of ~~pixels~~ pixel TFTs over ~~[[a]]~~ said substrate, ~~each of said pixels comprising at least first and second thin film transistors and a pixel electrode wherein a gate electrode of the first thin film transistor is electrically connected to a gate line and a gate electrode of the second thin film transistor is electrically connected to a drain region of the first thin film transistor, and the pixel electrode is electrically connected to one of source and drain regions of the second thin film transistor; and~~

a source driver and a gate driver which drive said active matrix circuit,

wherein n bit information out of m bit digital video data inputted from an external is used for a voltage gray scale method and (m-n) bit information is used for a time ratio gray scale method, where said m and said n are integers equal to or larger than 2 and satisfy $m > n$,

~~wherein each step of a voltage level for said voltage gray scale method is designated as $(V_H - V_L)/2^n$, where V_H is the highest voltage level of voltages inputted to a D/A converter circuit, and V_L is the lowest voltage level of voltages inputted to said D/A converter circuit, and~~
wherein an image is displayed by an image gray scale of $(2^m - (2^{m-n} - 1))$ patterns.

6. (Currently Amended) A display device comprising:

a plurality of pixels disposed in matrix over a substrate;

an active matrix circuit comprising a plurality of pixel TFTs over said substrate; and

a source driver and a gate driver which drive said active matrix circuit,

wherein n bit information out of m bit digital video data inputted from an external is used for a voltage gray scale method and (m-n) bit information is used for a time ratio gray scale method, where said m and said n are integers equal to or larger than 2 and satisfy $m > n$,

~~wherein each step of a voltage level for said voltage gray scale method is designated as $(V_H - V_L)/2^n$, where V_H is the highest voltage level of voltages inputted to a D/A converter circuit, and V_L is the lowest voltage level of voltages inputted to said D/A converter circuit, and~~

wherein one frame period comprises 2^{m-n} subframe periods, and

wherein an image is displayed by an image gray scale of $(2^m - (2^{m-n} - 1))$ patterns.

7. (Currently Amended) A display device comprising:

a plurality of pixels disposed in matrix over a substrate;

an active matrix circuit comprising a plurality of ~~pixels~~ pixel TFTs over ~~[[a]]~~ said substrate, ~~each of said pixels comprising at least first and second thin film transistors and a pixel electrode wherein a gate electrode of the first thin film transistor is electrically connected to a gate line and a gate electrode of the second thin film transistor is electrically connected to a drain region of the first thin film transistor, and the pixel electrode is electrically connected to one of~~

~~source and drain regions of the second thin film transistor;~~

a source driver and a gate driver which drive said active matrix circuit over said substrate; and

a circuit which converts m bit digital video data inputted from an external into n bit digital video data and provides said n bit digital video data to said source driver, wherein said m and said n are integers equal to or larger than 2 and satisfy $m > n$, wherein said circuit is formed over said substrate,

~~wherein each step of a voltage level for said voltage gray scale method is designated as $(V_H - V_L)/2^n$, where V_H is the highest voltage level of voltages inputted to a D/A converter circuit, and V_L is the lowest voltage level of voltages inputted to said D/A converter circuit, and~~

wherein an image is displayed by an image gray scale of $(2^m - (2^{m-n} - 1))$ patterns.

8. (Currently Amended) A display device comprising:

a plurality of pixels disposed in matrix over a substrate;

an active matrix circuit comprising a plurality of pixel TFTs over said substrate;

a source driver and a gate driver which drive said active matrix circuit over said substrate; and

a circuit which converts m bit digital video data inputted from an external into n bit digital video data and provides said n bit digital video data to said source driver, wherein said m and said n are integers equal to or larger than 2 and satisfy $m > n$, wherein said circuit is formed over said substrate,

~~wherein each step of a voltage level for said voltage gray scale method is designated as $(V_H - V_L)/2^n$, where V_H is the highest voltage level of voltages inputted to a D/A converter circuit, and V_L is the lowest voltage level of voltages inputted to said D/A converter circuit, and~~

wherein one frame period comprises 2^{m-n} subframe periods, and

wherein an image is displayed by an image gray scale of $(2^m - (2^{m-n} - 1))$ patterns.

9-19. (Canceled)

20. (Previously presented) A display device according to claim 3 wherein said display device comprises thresholdless antiferroelectric mixed liquid crystal indicating electro-optical characteristic of V-shape.

21. (Previously presented) A display device according to claim 4 wherein said display device comprises thresholdless antiferroelectric mixed liquid crystal indicating electro-optical characteristic of V-shape.

22. (Previously presented) A display device according to claim 5 wherein said display device comprises thresholdless antiferroelectric mixed liquid crystal indicating electro-optical characteristic of V-shape.

23. (Previously presented) A display device according to claim 6 wherein said display device comprises thresholdless antiferroelectric mixed liquid crystal indicating electro-optical characteristic of V-shape.

24. (Previously presented) A display device according to claim 7 wherein said display device comprises thresholdless antiferroelectric mixed liquid crystal indicating electro-optical characteristic of V-shape.

25. (Previously presented) A display device according to claim 8 wherein said display

device comprises thresholdless antiferroelectric mixed liquid crystal indicating electro-optical characteristic of V-shape.

26. (Canceled)

27. (Previously presented) A display device according to claim 3 wherein said m is 8 and said n is 2.

28. (Previously presented) A display device according to claim 4 wherein said m is 8 and said n is 2.

29. (Previously presented) A display device according to claim 5 wherein said m is 8 and said n is 2.

30. (Previously presented) A display device according to claim 6 wherein said m is 8 and said n is 2.

31. (Previously presented) A display device according to claim 7 wherein said m is 8 and said n is 2.

32. (Previously presented) A display device according to claim 8 wherein said m is 8 and said n is 2.

33. (Canceled)

34. (Previously presented) A display device according to claim 3 wherein said m is 12 and said n is 4.

35. (Previously presented) A display device according to claim 4 wherein said m is 12 and said n is 4.

36. (Previously presented) A display device according to claim 5 wherein said m is 12 and said n is 4.

37. (Previously presented) A display device according to claim 6 wherein said m is 12 and said n is 4.

38. (Previously presented) A display device according to claim 7 wherein said m is 12 and said n is 4.

39. (Previously presented) A display device according to claim 8 wherein said m is 12 and said n is 4.

40. (Canceled)

41. (Previously presented) A rear projector comprising three of the display devices according to claim 3.

42. (Previously presented) A rear projector comprising three of the display devices according to claim 4.

43. (Previously presented) A rear projector comprising three of the display devices according to claim 5.

44. (Previously presented) A rear projector comprising three of the display devices according to claim 6.

45. (Previously presented) A rear projector comprising three of the display devices according to claim 7.

46. (Previously presented) A rear projector comprising three of the display devices according to claim 8.

47. (Canceled)

48. (Previously presented) A front projector comprising three of the display devices according to claim 3.

49. (Previously presented) A front projector comprising three of the display devices according to claim 4.

50. (Previously presented) A front projector comprising three of the display devices according to claim 5.

51. (Previously presented) A front projector comprising three of the display devices

according to claim 6.

52. (Previously presented) A front projector comprising three of the display devices according to claim 7.

53. (Previously presented) A front projector comprising three of the display devices according to claim 8.

54. (Canceled)

55. (Previously presented) A single plate type rear projector comprising a display device according to claim 3.

56. (Previously presented) A single plate type rear projector comprising a display device according to claim 4.

57. (Previously presented) A single plate type rear projector comprising a display device according to claim 5.

58. (Previously presented) A single plate type rear projector comprising a display device according to claim 6.

59. (Previously presented) A single plate type rear projector comprising a display device according to claim 7.

60. (Previously presented) A single plate type rear projector comprising a display device according to claim 8.

61. (Canceled)

62. (Previously presented) A goggle type display comprising two of the display device according to claim 3.

63. (Previously presented) A goggle type display comprising two of the display device according to claim 4.

64. (Previously presented) A goggle type display comprising two of the display device according to claim 5.

65. (Previously presented) A goggle type display comprising two of the display device according to claim 6.

66. (Previously presented) A goggle type display comprising two of the display device according to claim 7.

67. (Previously presented) A goggle type display comprising two of the display device according to claim 8.

68. (Canceled)

69. (Previously presented) A portable information terminal comprising a display device according to claim 3.

70. (Previously presented) A portable information terminal comprising a display device according to claim 4.

71. (Previously presented) A portable information terminal comprising a display device according to claim 5.

72. (Previously presented) A portable information terminal comprising a display device according to claim 6.

73. (Previously presented) A portable information terminal comprising a display device according to claim 7.

74. (Previously presented) A portable information terminal comprising a display device according to claim 8.

75-76. (Canceled)

77. (Previously presented) A notebook type personal computer comprising a display device according to claim 3.

78. (Previously presented) A notebook type personal computer comprising a display device according to claim 4.

79. (Previously presented) A notebook type personal computer comprising a display device according to claim 5.

80. (Previously presented) A notebook type personal computer comprising a display device according to claim 6.

81. (Previously presented) A notebook type personal computer comprising a display device according to claim 7.

82. (Previously presented) A notebook type personal computer comprising a display device according to claim 8.

83. (Canceled)

84. (Previously presented) An EL display comprising a display device according to claim 3.

85. (Previously presented) An EL display comprising a display device according to claim 5.

86. (Previously presented) An EL display comprising a display device according to claim 6.

87. (Previously presented) An EL display comprising a display device according to claim

7.

88. (Previously presented) An EL display comprising a display device according to claim

8.

89-90. (Canceled)

91. (Previously presented) A mobile telephone comprising a display device according to claim 3.

92. (Previously presented) A mobile telephone comprising a display device according to claim 4.

93. (Previously presented) A mobile telephone comprising a display device according to claim 5.

94. (Previously presented) A mobile telephone comprising a display device according to claim 6.

95. (Previously presented) A mobile telephone comprising a display device according to claim 7.

96. (Previously presented) A mobile telephone comprising a display device according to claim 8.

97-98. (Canceled)

99. (Previously presented) A video camera comprising a display device according to claim 3.

100. (Previously presented) A video camera comprising a display device according to claim 4.

101. (Previously presented) A video camera comprising a display device according to claim 5.

102. (Previously presented) A video camera comprising a display device according to claim 6.

103. (Previously presented) A video camera comprising a display device according to claim 7.

104. (Previously presented) A video camera comprising a display device according to claim 8.

105-106. (Canceled)

107. (Previously presented) A mobile computer comprising a display device according to claim 3.

108. (Previously presented) A mobile computer comprising a display device according to claim 4.

109. (Previously presented) A mobile computer comprising a display device according to claim 5.

110. (Previously presented) A mobile computer comprising a display device according to claim 6.

111. (Previously presented) A mobile computer comprising a display device according to claim 7.

112. (Previously presented) A mobile computer comprising a display device according to claim 8.

113-114. (Canceled)

115. (Previously presented) A portable electronic book comprising a display device according to claim 3.

116. (Previously presented) A portable electronic book comprising a display device according to claim 4.

117. (Previously presented) A portable electronic book comprising a display device according to claim 5.

118. (Previously presented) A portable electronic book comprising a display device according to claim 6.

119. (Previously presented) A portable electronic book comprising a display device according to claim 7.

120. (Previously presented) A portable electronic book comprising a display device according to claim 8.

121-122. (Canceled)

123. (Previously presented) A personal computer comprising a display device according to claim 3.

124. (Previously presented) A personal computer comprising a display device according to claim 4.

125. (Previously presented) A personal computer comprising a display device according to claim 5.

126. (Previously presented) A personal computer comprising a display device according to claim 6.

127. (Previously presented) A personal computer comprising a display device according

to claim 7.

128. (Previously presented) A personal computer comprising a display device according to claim 8.

129-130. (Canceled)

131. (Previously presented) An electronic game equipment comprising a display device according to claim 3.

132. (Previously presented) An electronic game equipment comprising a display device according to claim 4.

133. (Previously presented) An electronic game equipment comprising a display device according to claim 5.

134. (Previously presented) An electronic game equipment comprising a display device according to claim 6.

135. (Previously presented) An electronic game equipment comprising a display device according to claim 7.

136. (Previously presented) An electronic game equipment comprising a display device according to claim 8.

137-138. (Canceled)

139. (Previously presented) An image reproduction device comprising a display device according to claim 3.

140. (Previously presented) An image reproduction device comprising a display device according to claim 4.

141. (Previously presented) An image reproduction device comprising a display device according to claim 5.

142. (Previously presented) An image reproduction device comprising a display device according to claim 6.

143. (Previously presented) An image reproduction device comprising a display device according to claim 7.

144. (Previously presented) An image reproduction device comprising a display device according to claim 8.

145-146. (Canceled)

147. (Previously presented) A digital camera comprising a display device according to claim 3.

148. (Previously presented) A digital camera comprising a display device according to claim 4.

149. (Previously presented) A digital camera comprising a display device according to claim 5.

150. (Previously presented) A digital camera comprising a display device according to claim 6.

151. (Previously presented) A digital camera comprising a display device according to claim 7.

152. (Previously presented) A digital camera comprising a display device according to claim 8.

153. (Previously presented) An EL display comprising a display device according to claim 4.

154. (New) A display device according to claim 3 wherein each step of a voltage level for said voltage gray scale method is designated as $(V_H - V_L)/2^n$, where V_H is the highest voltage level of voltages inputted to a D/A converter circuit, and V_L is the lowest voltage level of voltages inputted to said D/A converter circuit.

155. (New) A display device according to claim 4 wherein each step of a voltage level for said voltage gray scale method is designated as $(V_H - V_L)/2^n$, where V_H is the highest voltage

level of voltages inputted to a D/A converter circuit, and VL is the lowest voltage level of voltages inputted to said D/A converter circuit.

156. (New) A display device according to claim 5 wherein each step of a voltage level for said voltage gray scale method is designated as $(VH-VL)/2^n$, where VH is the highest voltage level of voltages inputted to a D/A converter circuit, and VL is the lowest voltage level of voltages inputted to said D/A converter circuit.

157. (New) A display device according to claim 6 wherein each step of a voltage level for said voltage gray scale method is designated as $(VH-VL)/2^n$, where VH is the highest voltage level of voltages inputted to a D/A converter circuit, and VL is the lowest voltage level of voltages inputted to said D/A converter circuit.

158. (New) A display device according to claim 7 wherein each step of a voltage level for said voltage gray scale method is designated as $(VH-VL)/2^n$, where VH is the highest voltage level of voltages inputted to a D/A converter circuit, and VL is the lowest voltage level of voltages inputted to said D/A converter circuit.

159. (New) A display device according to claim 8 wherein each step of a voltage level for said voltage gray scale method is designated as $(VH-VL)/2^n$, where VH is the highest voltage level of voltages inputted to a D/A converter circuit, and VL is the lowest voltage level of voltages inputted to said D/A converter circuit.